



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,987	09/28/2001	Daniel D. Bloch	38190/235967	5823
826	7590	08/24/2004	EXAMINER	
ALSTON & BIRD LLP BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000			PUNNOOSE, ROY M	
		ART UNIT	PAPER NUMBER	2877

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/966,987	BLOCH ET AL.
	Examiner	Art Unit
	Roy M. Punnoose	2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 5/24/04.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-26 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 8 and 24 is/are allowed.  
 6) Claim(s) 1-7,9-11,17-23,25 and 26 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 28 September 2001 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/28/01</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of claims 1-11 and 17-26 in the reply filed on May 24, 2004 is acknowledged. Applicant may file divisional(s) for all non-elected claims. However, the applicant is required to cancel all non-elected claims in response to this office action.

***Specification***

2. The specification is objected to because of the following informalities: On page 10, line 18, the word "portion" is incorrectly presented as "potion". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 5 and 21, it is not clear whether the collimating lens is located at the distal end of the optical fiber or at the near end of the optical fiber. It should be noted that a collimating lens could be in optical communication with a distal end of said optical fiber even if its location is at the near end of the optical fiber. Appropriate correction is required.

5. Claims 6 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 6 and 22, it is not clear whether the

focal lens is located at the distal end of the optical fiber or at the near end of the optical fiber. It should be noted that a focal lens could be in optical communication with a distal end of said optical fiber even if its location is at the near end of the optical fiber.

Appropriate correction is required.

6. For examination purpose, it is assumed that the location of the collimating and focal lenses referred to in paragraphs 4 and 5 above are at the distal end of the optical fiber.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2, 11, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927).

9. Claims 1, 2, 11, 17 and 18 are rejected because:

A. Van Hengel et al (Van Hengel hereinafter) discloses an apparatus comprising:  
at least one optical probe 14 capable of being introduced into the hole 9, wherein  
said probe 14 directs light radially toward a hole-wall 10 and receives light  
reflected off the hole-wall 10 (see Figures 2 and 3);  
a light source 11 for providing light to said optical probe 14;  
a display 23 (see Figure 3) for representing the measurements of the  
characteristics of the hole; and

an optical receiver 18 for receiving light from said optical probe 14 that has reflected off the hole wall 10 and been received by said optical probe 14, said optical receiver 18 also adapted to measure the intensity (see col.7, lines 13-15) of the light reflected off the hole wall 10 so as to permit different materials to be distinguished (see col.6, lines 14-49), wherein said optical probe 14 is capable of being introduced into the hole 9 without contacting the hole-wall 10 on a substrate comprising a stack of materials 2, 3, 4, 5 (see Figure 2) for measurement of the characteristics of the interior of the hole.

However, Van Hengel do not teach of an optical probe having at least one optical fiber to direct light radially toward a hole-wall and to receive light reflected off the hole-wall for non-contact measurement of the characteristics of the interior of the hole.

- B. Brown teaches of an optical probe 10 (see col.6, lines 13-16 and Figure 1) having at least one optical fiber 30 to direct light radially toward a hole-wall 14 and to receive light reflected off the hole-wall 14 for non-contact measurement of the characteristics of the interior of the hole.
- C. In view of Brown's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Brown's teaching of an optical probe comprising at least one optical fiber into Van Hengel's apparatus light can be easily and efficiently transmitted and/or received with said optical fiber for non-contact measurement of the characteristics of the interior of the hole.

10. Claims 3 and 19 are rejected because Van Hengel and Brown teach all the claim limitations as detailed in paragraph 9 above except for the explicit disclosure of identifying an interface between two materials. Van Hengel discloses a stack of four different materials (see Figure 2), wherein one of the middle layers can be considered as an interface. Therefore, in view Van Hengel's disclosure measuring of a stack of materials, it would have been obvious to one of ordinary skills in the art at the time the invention was made to easily and efficiently identify an interface between two materials with non-contact measurement of the characteristics of the interior of the hole.

11. Claims 4 and 20 are rejected because Van Hengel and Brown teach all the claim limitations as detailed in paragraphs 9 and 10 above except for the explicit disclosure of distinguishing between a material that defines the hole and air so as to identify the backside of the hole. Since air can be considered as a material, it would have been obvious to one of ordinary skills in the art at the time the invention was made to identify and distinguish an interface between air and any given material so as to easily and efficiently identify the backside of the hole with non-contact measurement of the characteristics of the interior of the hole.

12. Claims 5 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927) and further in view of Kawahara (US 3,817,635).

13. Claims 5 and 21 are rejected because:

- A. Van Hengel and Brown discloses all the claim limitations as detailed in paragraph 9 above except for the teaching of the use of a collimating lens in optical communication with a distal end of said optical fiber for

transmitting collimated light toward the hole-wall for non-contact measurement of the characteristics of the interior of the hole.

B. Kawahara discloses the use of a collimating lens 52 in optical communication with a distal end of said optical fiber 29 for transmitting collimated light toward the hole-wall (see col.5, line 65- col.6, line 7 and

Figure 14) for non-contact measurement of the characteristics of the interior of the hole.

C. In view of Kawahara's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Kawahara's teaching of the use of a collimating lens into Van Hengel's and Brown's apparatus for the purpose easily and efficiently transmitting collimated light toward the hole-wall for a more accurate non-contact measurement of the characteristics of the interior of the hole.

14. Claims 6, 7, 9, 22, 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927) and Kawahara (US 3,817,635) and further in view of Doyle, Jr. (US6,633,378).

15. Claims 6 and 22 are rejected because:

A. Van Hengel, Brown and Kawahara discloses all the claim limitations as detailed in paragraphs 9 and 13 above except for the teaching of the use of a focal lens in optical communication with a distal end of said optical fiber for transmitting focused light toward the hole wall and wherein said optical fiber is moveable in a radial direction in order to coincide the focal

point of the light with the hole wall for non-contact measurement of the characteristics of the interior of the hole.

B. Doyle, Jr. (Doyle hereinafter) discloses the use of a focal lens 10 (see col.4, lines 39-42) in optical communication with a distal end of an optical fiber 8 for transmitting focused light toward a hole wall and wherein said optical fiber is moveable in a radial direction in order to coincide the focal point of the light with the hole wall for non-contact measurement of the characteristics of the interior of the hole.

C. In view of Doyle's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Doyle's teaching of the use of a focal lens into Van Hengel, Brown and Kawahara's apparatus for the purpose of easily and efficiently transmitting focused light toward a hole wall and wherein said optical fiber is moveable in a radial direction in order to coincide the focal point of the light with the hole wall for a more accurate non-contact measurement of the characteristics of the interior of the hole.

16. Claims 7, 9, 23 and 25 are rejected because:

A. Van Hengel, Brown and Kawahara discloses all the claim limitations as detailed in paragraphs 9 and 13 above except for the explicit teaching that the optical fiber is rotatable to permit the distance to the hole wall to be measured at various points about the circumference for non-contact measurement of the characteristics of the interior of the hole.

- B. Kawahara's apparatus comprising/including the optical fiber is rotatable to permit the distance to the hole-wall to be measured at various points about the circumference for non-contact measurement of the characteristics of the interior of the hole.
- C. Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to rotate Kawahara's apparatus comprising/including the optical fiber to permit the distance to the hole-wall to be measured at various points about the circumference for a more efficient and accurate non-contact measurement of the characteristics of the interior of the hole.

17. Claims 10 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927) and further in view of Peterson (US 5,325,177).

18. Claims 10 and 26 are rejected because:

- A. Van Hengel and Brown discloses all the claim limitations as detailed in paragraph 9 above except for the teaching of the use of a position feedback device for determining the linear position of said optical fiber relative to the hole-wall for non-contact measurement of the characteristics of the interior of the hole.
- B. Peterson discloses a position feedback device 64 (see col.4, lines 19-59) for determining the linear position of an optical fiber relative to the hole-wall for non-contact measurement of the characteristics of the interior of the hole.

C. In view of Peterson's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Peterson's teaching of the use of a position feedback device into Van Hengel's and Brown's apparatus for the purpose easily and efficiently determining the linear position of said optical fiber relative to the hole-wall for a more accurate non-contact measurement of the characteristics of the interior of the hole.

***Allowable Subject Matter***

19. Claims 8 and 24 are allowable.
20. Claims 8 and 24 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious an apparatus and method for measuring characteristics of a hole comprising a movable mirror and an optical splitter for directing light from a light source both to said movable mirror and an optical fiber, in combination with the rest of the limitations of the respective claims and the limitations of independent claims 1 and 17 respectively.

***Drawings***

21. The drawings are objected to under 37 CFR 1.83(a) because they fail to show item 41 in Figure 8 as described on page 16, line 25 of the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being

Art Unit: 2877

amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Conclusion***

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Roy M. Punnoose** whose telephone number is **571-272-2427**. The examiner can normally be reached on 9:00 AM - 5:30 PM.

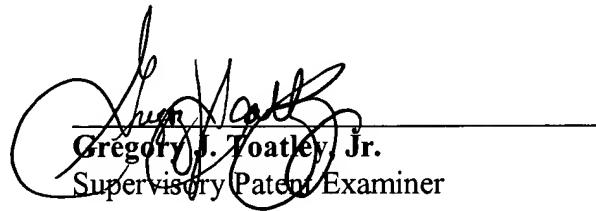
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Gregory J. Toatley, Jr.** can be reached on **571-272-2059**. The fax phone number for the organization where this application or proceeding is assigned is **703-872-9306**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For

Art Unit: 2877

more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Roy M. Punnoose  
Patent Examiner  
Art Unit 2877  
August 22, 2004



\_\_\_\_\_  
Gregory J. Toatley Jr.  
Supervisory Patent Examiner